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UNITED STATES ATOMIC ENERGY COMMISSION

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In the Matter of

J. ROBERT OPPENHEIMER

TRANSCRIPT OF HEARING

Before

PERSONNEL SECURITY BOARD

Washington, D.C.

April 12, 1954, through May 6, 1954

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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Thursday, April 22, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the Board, at 9:30 a.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Mr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb, and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman; and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.



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Page and Line No. U.S. GPO copy; 1954	Remarks	Page No. Classified Copy
484 28th from bottom	After the words <u>definition of it.</u> Add (new paragraph):  "Dr. Nordheim was also specifically interested in a definite type of thermonuclear system, and made very definite contributions to the potential design of such systems."	1597
487 31st from top	After the words <u>to be successful.</u> Add: "and we would not have made the relevant progress which would have been required in the fission field."	1606
492 4th from bottom	After the words <u>fission bombs.</u> Add: "Thirdly, we would not have been able to make use of it practically because we would not have had the comparable skills, let us say, to make fission bombs whose characteristics would be appropriate to this sort of a system. Of course, by that I am implying that there are certain relationships between these things, and that will have to be a part of this argument."	1625
497 22nd from bottom	After <u>A.</u> Add: "In Russia."	1642
503 18th from bottom	After the words <u>increased in numbers.</u> Add: "as against what we supposed to be the current plans on the production schedule."  "Q. You mean the current plans with respect to the proportion which should be assigned to the Strategic Air Command."  "A. As I recall it, the nature of the proposal was to considerably increase the amount available for the smaller weapons -- my recollection is weak on this -- but I don't think it seriously or greatly changed the amount available for the big weapons. I may be wrong on that."	1661 & 1662

See Vol IX a

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504  
2nd from top

"Let me point out that the technology was developing at that stage to the point where it became possible to make these weapons with a much smaller amount of fissionable material than had previously been regarded as necessary."

After the words military strength. Add:

1663

"He was quite convinced, as was I, that the Department of Defense had not yet realized what the potentialities of the atomic weapon were, and hence were riding the initial horse of nothing but the strategic air use of the weapon, and failing to capitalize on other uses, specifically in this case the uses in the possible defense of Western Europe.

"Q. Did he express any opinion as to any announcement with respect to the strategic bombing of Russia?

"A. We discussed the question of whether an announcement in terms of the strategic bombing of Russia would be desirable or undesirable. I think we all reached the conclusion that anything which implied any hesitancy on the part of the United States about being willing to retaliate with the atomic bomb would be disastrous. That the enemy must have no question or no feeling that there was a question in the minds of the United States about the willingness to retaliate.

"Q. When you say 'we', whom do you mean?

"A. I mean the four of us."

504

Immediately following line 11 delete line of \* \* \* \*s and insert the following:

1664

"Q. What was yours?



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Page and Line No.  
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Page No.  
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504 "A. My view was that we must give no intimation to Russia that we would hesitate to retaliate with the strategic bombing" 1667

506 "Q. Now will you go ahead and tell us what they said about it?" 1671

8th from top "A. Yes. They were quite disturbed that the effect of the presentation of atomic weapons in the tactical picture would react unfavorably upon the strategic air force which -- no, I will try to give you what they said -- on the strategic air force and its mission to knock out Russia."

9th from top After the words to appraise this and. Add: "biological warfare and chemical warfare." 1671

507 After the words responsible there. Add: "and every time the answer came up that while we had the gun pointed at Russia's heart, Russia now has it as well pointed at our heart. Either one can put it through to knock the other fellow out." 1674 & 1675

Following line 9, delete line of stars and add the following:

"Q. Dr. Whitman, if you can answer this in the presence of people who are not cleared to receive classified information, would you say whether the military is now following the policy of the broad use of atomic weapons pretty much as you stated Dr. Oppenheimer's views to be?"

"A. As of the time when I left the Defense Department last summer, there was great progress in that direction. I can't speak beyond that, the 31st of July 1953.

"Q. Was that true in connection with the defense of Europe, too, again if you can say it?"

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Page and Line No.  
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Remarks

Page No.  
Classified  
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510  
5th from bottom

"A. Yes. Of course, we are also, or they were actually seriously considering the use of the atomic weapon in our own air defense here in this continent."

After the word destructiveness. Add (new paragraph):

1688

"A. I believe that to be true. Whether it was portable at that time or not is another question."

511  
18th from bottom

After the words among the population. Add: (new paragraphs):

1690  
&  
1691

"Q. Do you think you know in a general way what is going on in Guatemala and how the Communists are manipulating affairs there?

"A. Yes. You will find that there are very, very few, if any, in elective office. They are always appointed, and they are in the policy positions only. Not often are the presidents of the countries Communist or Communistically inclined until they are in so deep that they can't get out of it.

"DR. EVANS: Would you say that again?

"THE WITNESS: None of the countries with which I am familiar are any of the out and out Communists that report to the Internationale in Moscow ever elected to office. They don't run for office except very, very seldom. In Guatemala especially there is not a one of them that is in an elective office. They get themselves appointed to policy control officers lower down than the Congress. You will find them appointed as judges very frequently. So that they can control the judicial and also the labor."

514  
4th from top

After the words Government officials. Add: "in these countries which have now become Communistic."

1699



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Page and Line No. <u>U.S. GPO copy; 1954</u>	<u>Remarks</u>	Page No. Classified <u>Copy</u>
519 28th from top	After the words <u>being considered, was.</u> Add: "a design which it was not clear would be operable. At least it was."	1716
521 21st from top	After the words <u>and the Army.</u> Add: "particularly the collaboration between the Air Force and the Army in tactical air operations. It was broadened to include the general operations of the Army and Air Force problems."	1723
521 28th from top	After the words <u>Institute staff.</u> Add: "to examine the use of atomic weapons in Army and Air operations and had made substantial progress in their thinking about the tactical uses of them.	1723 & 1724
	"This was on the potential battle of Western Europe. In order to make our problem definite, we examined what might happen in Western Europe in case of a Russian invasion into that area and what weapons and techniques the Army, Navy and Air Force could use in combating such an invasion.	
	"One group, as I say, under Dr. Bacher had the special responsibility in asking to what extent and in what way and under what conditions would atomic weapons be useful in such a battle. By the end of the summer a fairly complete chapter of our final report had been prepared on the subject.	
521 5th from bottom	After the words <u>their problems.</u> Add: "with tanks, mines and the possible maneuvers which they would undergo to avoid atomic attacks by the Russians, the ways in which they would try to focus and funnel and channel an enemy attack so that it would be a good atomic target, the problems which the Army faced in laying mine fields, and so on."	1726
522 5th from top	After the words <u>of our discussions.</u> Add: "Q. To what extent, if you know, and if you don't, tell us, have the recommendations of the Vista Report been put into effect?	1726, 1727, 1728 & 1729



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
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"A. To what extent have they been?

"Q. Yes.

"A. It is rather interesting that Dr. Lauritsen is at this moment engaged with a committee which has been established at the request of the Chief of Staff of the Army to examine into this question of how effectively the Army is implementing the recommendations of the Vista Report. He is now visiting Fort Monroe and Fort Bragg, I believe, in an attempt to find out, which of the Vista Report recommendations are being implemented and how effectively. A report is to be made to the Chief of Staff of the Army on this subject within the next two weeks.

"Q. In general has there been a movement toward the equipment of the forces in Western Europe with atomic weapons?

"A. I think in the field of atomic weapons the Vista Report was one of the first reports strongly to emphasize the potential importance of atomic weapons in tactical air operations. There had been many in the Army and in the Air Force who advocated the use of atomic weapons for this purpose and a number of officers discussed the use of atomic weapons with the members of the Vista staff. We became convinced that atomic weapons were available and more of different varieties would be available in the future small enough to be carried by small aircraft, and therefore useable in tactical operations, close-in operations against enemy tactical installations, troop concentrations, tank columns, supply dumps, tactical air fields, and so on.

"We strongly advocated that the Air Force and the Army examine more carefully this potentiality of using the smaller type of atomic weapon, smaller in physical dimension, as well as in yield, for these tactical air operations. We were not allowed to say in the report how much fissionable material the



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Page and Line No.  
U.S. GPO copy; 1954

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Page No.  
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United States possessed at that time, though some members of our group knew. We were therefore not able to illustrate quantitatively the argument which we felt was sound, that the time had approached or would soon be here when there was sufficient fissionable material so that the strategic needs could be met and also material be made available for tactical uses. That time is certainly here now.

"We felt that it was here in 1951, at least when plans should be made for using some of our supply of fissionable materials in tactical operations. This was one of the features of our report, that is, advocating in some detail how it could be done, and under what conditions and how must economically and effectively our fissionable material could be used in assisting in the defense of Western Europe.

"Q. Without going into details and without touching upon classified material, have those recommendations been carried out to any extent?

"A. To the best of my knowledge, and I am not fully aware of the present plans -- I will be in Paris again next week and may find out more about it -- the idea of the tactical use of atomic weapons has now long been accepted as an important and essential tactical idea and operation. I believe that the Vista Report had some influence on this. Whether it did or nor, at least by now tactical air operation with the use of atomic weapons is an accepted technique and doctrine.

527  
21st from top

After the words insofar as the. Add: "tactical." 1746

527  
30th from top

After the words Brief recess. Add the following: 1747 -  
1758

"CLASSIFIED PORTION OF DR. DuBRIDGE's TESTIMONY

"MR. GRAY: Mr. Reporter, would you have the record show that at this point when it became necessary to

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question the witness about classified matters, Mr. Garrison and the others were excused. The record should show that Dr. Oppenheimer remains.

"(Whereupon, counsel for Dr. Oppenheimer withdrew from the hearing room.)

"BY MR. ROBB:

"Q. Doctor, I want to read you three paragraphs and ask you whether or not they state in substance the salient points of the introduction to the VISTA report.

"A. Is it proper, Mr. Chairman, for me now to ask what document the counsel is reading from?

"Q. I am sorry, but even now I cannot disclose what the document is, sir, and under the circumstances which we have it.

"A. Can you tell me from whose statement you are quoting?

"Q. I am told I can't do that either, Doctor.

"MR. ROLANDER: That is correct.

"BY MR. ROBB:

"Q. I am going to read you the three paragraphs, Doctor, and ask you whether or not they state in substance the salient points of the introduction to the VISTA report which you have testified Dr. Oppenheimer helped to prepare.

"A. May I say I assume you mean the introduction to Chapter 5 of the VISTA report?

"Q. Yes,

'1. The available stockpile of atomic weapons should be divided into three equal parts (equal



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Page No.  
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from the point of view of available fissionable materials). One part should be held in reserve, one part should be assigned to SAC, and the third part should be assigned to the tactical defense of Europe in accordance with the VISTA recommendations. Appropriate re-working of existing weapons should be begun at once.

'2. The U. S. should announce that no strategic atomic attack would be directed against Russia unless such an attack were first started by Russia either against ZI (which, I guess, means Zone of Interior) or against European Allies.

'3. At the present state of the art, the value of thermo-nuclear weapons cannot be assessed. Therefore, they are not included in the VISTA study.'

"Would like me to read any of those again, Doctor?

"A. I may ask you to read them again, but I think I can make some comments.

"Q. Do you want to take them up one at a time?

"A. Yes. Number 1: It was our suggestion in the report that the fissionable material stockpile be divided into three parts and we suggested rather generally that possibly an equal division would be suitable. I think we did not make it accurately equal. That a certain segment of the stockpile should be assigned to strategic air operation, a certain segment to tactical and a certain segment held in reserve to see how the war went and assigned them as the battle progressed.

"We said that it is possible that three equal parts would be proper. In other words, without certifying to the particular words you read, the general idea of three parts of our stockpile was recommended by the VISTA project.

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Page and Line No.  
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Page No.  
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"As to the second, I do not recall that we made any such recommendation, although, of course, this is a matter that the record of the final VISTA report would show.

"Q. Excuse me, Doctor, I was not asking about your recommendation. I was asking whether or not that was in the introduction which you had in November which was prepared with the assistance of Dr. Oppenheimer?

"A. I see. You are not asking whether this was in the final VISTA report, but in an intermediary version of the report.

"Q. Yes, sir.

"A. Since there were many intermediate versions, it is hard for me to swear as to what any one of them said. But I do not recall any such recommendation ever being proposed that we should announce anything about our strategic intentions relative to an attack on Russia.

"We were specifically not supposed to examine strategic air warfare problems in the VISTA stage. But since this question of the possible use of fissionable materials for tactical situations came up we had to make some suggestions that tactical as well as strategic operations were useful for military purposes.

"I do recall that the final version of the report --

"Q. Excuse me, but would you confine yourself to the draft for the time being. I don't want to cut you off in any way, however.

"A. Yes. I can recall of no such specific recommendation ever being included in a version of the report.

"Q. Whether it was this specific recommendation or not, was there anything comparable to this that you recall?



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Page and Line No.  
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Remarks

Page No.  
Classified  
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"A. That is what I was trying to get at. This statement reminds me of a statement which was in the report, namely, we recognized the possibility that at the outbreak of a war we, The United States, would decide not to initiate instantly a strategic attack on the USSR, and that in that case we might still want to use atomic weapons on the battle field.

"Certainly the report at various stages did have a suggestion of this sort in it -- that there might be a situation which would arise in which we would withhold a strategic attack.

"Q. Was that in the final report?

"A. That was in the final report and in the intervening ones, too, I think, or something similar to it.

"Q. Now, the third suggestion.

"A. Our point of view throughout the VISTA study on thermo-nuclear weapons was that we did not see that they had tactical value. We made no comment on their importance as strategic weapons. But we did say that in as much as we see at the present time, no tactical usefulness to thermo-nuclear weapons, we will not further discuss them.

"Q. Then this 'third' is about right.

"A. Except for the very important word 'tactical'. We did not see these thermo-nuclear weapons being used on the battle field and we made no comment on their strategic use.

"May I explain that point a bit.

"Q. Yes, sir.

"A. We were envisioning a battle in Western Europe, presumably an invasion by Russian armies of Western

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
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Europe, and that we would be forced then into a battle of the NATO armies against the RUSSIAN armies in Western Europe between the Rhine and the border of the Soviet Zone.

"We looked at the question of atomic weapons being used on armies in that area. We felt that if a thermo-nuclear weapons was available and used on armies, that its area of destruction through blast and its area of damage through radio activity would be so great that we would be destroying many civilian populations in a friendly area -- Western Germany -- to such a great extent that the use of such a terribly destructive weapon in Western Germany was not feasible and not desirable and would be against our interests.

"Therefore, we saw no tactical use for it in that kind of a battle. Therefore, we made no further study of the thermo-nuclear problem in that report.

"Q. I see. Was it then that particular point that General Quesada wish to present some information to you gentlemen?

"A. General Quesada did not address himself to that particular point, as I recall. He may have agreed with it. I don't recall that he disagreed with it.

"Q. Doctor, I have before me a paper which is marked, 'Extracts from VISTA report, Introduction to Chapter 5, Atomic Warfare', which, I assume, is the final draft. I am going to hand it to you in just a moment.

"I notice in here at the top of page 2 the sentence, 'We have a prospect, probable but not certain, of a thermonuclear system in the range of many megatons that may be available within two years although cost, characteristics and utility cannot today be estimated.'

"I will hand you this and ask you if you would please, sir, give your comments on the one sentence I read or anything else you want to talk about.



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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"MR. GRAY: Does that purport to be the final report?

"MR. ROBB: That is what I understand. Perhaps Dr. DuBridge could help us on that. It just came to me, Mr. Chairman, at noon today.

"THE WITNESS: I cannot swear that I know this is a true copy of the final report. I do recognize it as being very similar to the final version.

"I would like to note that the sentence which you read was at the end of several paragraphs which stated that the fissionable material resources of the U. S. were growing at a very large rate and that 'We have a resource of great magnitude and that even in the near future we can contemplate many military applications and a wide variety of targets and target systems', and then it goes on to describe a number of different warheads available in the fission weapon ranging from 1 to 500 kilotons. Then it goes on to describe the various sizes and diameters of such fission weapons and stating how the fissionable material supply is increasing and also design improvements are increasing our stockpile.

"As one element in this picture of our atomic weapon arsenal, we say that we have this prospect, probable but not certain, of a thermonuclear weapon in the range of many megatons that may be available in two years, although cost, characteristics and utility cannot today be estimated.

"It seems to me that that was a statement at that time of a fact or a possibility and I think it was a correct statement at the time -- that there was probable but not certain a thermo-nuclear system in the range of many megatons and that the cost, characteristics and utility could not then be estimated.

"BY MR. ROBB:



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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"Q. I had the idea from some of the testimony here that in the spring of 1951 there was a discovery made which made the production of a thermo-nuclear weapon certain. Am I mistaken about that?

"A. Certainty in a new field does not occur until one has the final test made. There was no stage at which certainty came until the tests were successful. At this time there was no test which had shown a yield of many megatons. I think it could not be certain at that time that a many megaton yield was available. It is correct to say that there was a prospect, but not certainty.

"Q. What sort of tests had been made at that time, Doctor?

"A. This was the latter part of 1951. The final report went in the early part of 1952. There was just the one so-called GREENHOUSE test. I do not recall the exact characteristics of that test.

"Q. Was some kind of a thermo-nuclear gadget tested?

"A. The answer is that there were some tests. I personally did not familiarize myself with the details of the thermo-nuclear tests at that time because of what was previously said, that it did not seem to be an essential part of our VISTA study.

"It does seem to me, Mr. Chairman, that it is perfectly true that there was a very complex technical situation in the laboratory and in the test which developed from 1946 even right up until the present day.

"The technical problems associated with the developments cannot be discussed in public because they are highly classified, but these developments have been very complex and at each stage there have, of course, been differences of opinion as to the best technical approach and the possible prospects of success and the degree to which success would be achieved and



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

how soon it would be achieved and what the costs would be.

"It seems to me that in a new technical field of this sort, differences of opinions, exchanges of ideas are essential, inevitable and desirable. And to interpret any such differences of opinion or statements made during the process as evidence of a lack of integrity or loyalty to the United States is quite unwarranted.

"Q. I was not attempting to interpret anything. I was trying to find out what happened.

"A. The purpose of this inquiry, however, is to inquire into the loyalty of an individual. I only want to make it clear that my position is that technical differences of opinion are desirable parts of the development of any new device and progress in any direction in the field of science and technology.

"Q. Did Dr. Clark Milliken dispute the conclusions expressed in the draft that you read there?

"A. In this (indicating)?

"Q. No, sir; the draft that you read in November, 1951, at the meeting in Pasadena?

"A. Possibly. Many people argued about it. The VISTA study was a study in which all possible ideas were stated, explored, inquired into, argued about, disagreed about. There were many points of argument. When we finally got our final report written, it was, I think, unanimously agreed to. I cannot recall the nature and precise timing of the many discussions and disagreements that went on in the process.

"Q. I can well understand that.

SECRET

Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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"MR. ROBB: Mr. Chairman, that is all the questions I can ask about this particular subject. Does the Board wish to ask any questions? If Dr. Oppenheimer has any questions, I would be very glad to help him phrase them, if he wants any help.

"MR. GRAY: I think I have no questions about this particular matter. Do you, Dr. Evans?

"DR. EVANS: No.

"MR. GRAY: Mr. Morgan?

"MR. MORGAN: No.

"MR. GRAY: Dr. Oppenheimer?

"DR. OPPENHEIMER: Do you remember the views of General Quesada and Mr. McCone of the rough drafts of Chapter 5 of VISTA?

"THE WITNESS: Yes, very clearly. We presented to both General Quesada and John McCone --

"MR. GRAY: 'We' being who?

"THE WITNESS: We being members of the VISTA group. I was present at the sessions. There were several; Dr. Oppenheimer was present at some, Dr. Lauritsen, Dr. Bacher, Dr. Christie were present at various sessions with McCone and Quesada.

"I remember very clearly that both McCone and Quesada expressed rather enthusiastically their agreement with the approach of Chapter 5 and its introduction. They felt that this was a proper, useful and desirable approach to the subject, and they expressed agreement with it.

"MR. GRAY: This was Chapter 5 substantially as it finally appeared?



SECRET

Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
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"THE WITNESS: It was an intermediate version at that time, but the ideas were substantially as in the final version.

"DR. OPPENHEIMER: I don't think I should pretend to be counsel, If we are going off the top secret section. I will have counsel back.

"MR. GRAY: Yes.

"MR. ROLANDER: As a security matter, it is your testimony and you consider it to be top secret. You are familiar with this project?

"THE WITNESS: That is true. I would not attempt to decide which sentences I uttered should be classified.

"MR. ROLANDER: Until this is reviewed, I would like the reporter to consider this classified as top secret.

"(Whereupon, counsel for Dr. Oppenheimer entered the hearing room.)"

530  
7th from top

After the words means independent. Add: "that a thermonuclear explosion is quite impossible without an extremely effective and large fission explosion initiating it."

1767

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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Friday, April 23, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the board, at 9:30 a.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Dr. Ward V. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrieon, Samuel J. Silverman, and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.



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Page No.  
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564  
5th from bottom

After the word information. Add: "Moreover, since that occurred, Mr. Chairman, there has been a discussion in the press in this country which in my opinion has been infernal speculation, guessing, prying, the reporting of this technical feature and what, which has performed for the Russians so much that I can't understand why they need any spy network in this country. We deliver it to them on a platter. If that didn't aid them, I would like to know what would."

1977

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UNITED STATES ATOMIC ENERGY COMMISSION

PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Monday, April 26, 1954

The above entitled matter came on for hearing pursuant to recess before the board, at 9:30 a.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb, and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer; Lloyd K. Garrison; Samuel J. Silverman; and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.



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Page and Line No.  
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Remarks

Page No.  
Classified  
Copy

578  
29th from bottom

After the words Pacific war. Add: "Ultimately they were made by the millions. At the end of the war, the total budget in the Navy for rockets was a million dollars a month, I understand."

2012 &  
2013

582  
31st from bottom

After the words Hartwell project. Add: "It was a contract between the Navy and the Massachusetts Institute of Technology. The purpose of it was to study possible improvements in submarine warfare -- that is, antisubmarine warfare."

2026

582  
23rd from bottom

After the word Charles. Add: "This was also a Massachusetts Institute study."

2026

582  
22nd from bottom

After the word Laboratory. Add: "which now is considered the most important establishment in this country for the Air Force program in continental defense."

2026

582  
20th from bottom

After the words the Vista study. Add: "The purpose of that was to see if methods and tactics and weapons could be devised that would make it possible to hold in Western Europe, rather than to abandon if the Russians should decide to invade Western Europe. The Assignment we had was ground and air combat."

2027

583  
11th from bottom

After the words Vista study. Add: "namely, the objectives of discouraging the Russians from trying to occupy Western Europe, and at least make sure that they cannot win Western Europe by military means without serious destruction."

2031

"Q. Without serious destruction to whom?

"A. To property and equipment. We believe that the greatest danger would be if they could somehow occupy Western Europe intact as it were."

583  
7th from bottom

After the words World War II. Add: "to determine where we should try to hold a line, to what extent we could make preparations ahead of time with such things as demolitions and land mines and weapons that

2031



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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were placed in position ahead of time and dispositions of ground forces. In particular, since our problem was ground and air combat --

"Q. You are speaking of Vista now?

"A. Of Vista. How we could get more effective cooperation, more effective assistance from the Air Force, so that the armies could hold, or at least so that they would go backwards as slowly as possible."

584  
19th from top

After the words ideas on. Add: "the specific subject of how to use tactical atomic weapons in connection with supporting ground operations. This was".

2033

584  
28th from bottom

After the words we felt that. Add: "the stockpile was rapidly getting sufficiently large so that".

2034

584  
last line

After the words essential idea. Add: "of using atomic weapons for supporting our ground troops and making it possible to hold as far forward as possible."

2035

585  
12th from top

After the word weather. Add: "This included specifically developments of weapons and tactics that could be employed at very low altitudes. Up until that time it was not possible to deliver a weapon at low altitude because you would blow yourself up if you tried to do so. So one of the essential requirements was to get a weapon that you could deliver at low altitude in bad weather with high accuracy."

2036

585  
33rd from top

After the words ground operations. Add: "For making it possible to operate an army in Western Europe and to resist aggression in Western Europe. One plan in this was to develop weapons specifically for destroying the Russian Air Force on the ground. The second was to destroy mass attacks which as we have learned by sad experience we have no way of resisting. If we could force these concentrations

2037 &  
2038



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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and then strike them with appropriate atomic weapons, we believed a breakthrough would be very difficult. In fact, it might not be attempted.

585  
28th from bottom

After the words tactical use. Add: "-- the attack on Russia -- by tactical use, I mean primarily hitting enemy concentrations in your immediate front, mass concentrations."

2038

585  
25th from bottom

After the words more true now. Add: "since our stockpile has increased enormously."

585  
21st from bottom

After the word weather. Add: "from any altitude, including very low altitude."

585  
8th from bottom

After the words striking us. Add: "with the same kind of weapons that we were planning to use in our strategic attack on Russia."

2039

585  
4th from bottom

After the words principal cities. Add: "This was the purpose of the Charles study."

585  
last line

After the words 1950 or 1951. Add: "It was the first study on air defense. There had been previous study by a panel of the scientific advisory board in the Air Force, and there was a project going on improving some of the radar stations in this country. This was going on at the time of the Charles study was started. The Charles study concluded that this was a very sound effort, but utterly inadequate because they are already here when these radar stations pick them up. They were primarily for the purpose of organizing our interceptors. We felt that the warning should be pushed out as far as possible in order to make better use of our interceptors and to concentrate them where the attack was going to come, and also in order to make possible some sort of civilian defense, which is hopeless without some warning. So our purpose was to get at least an hour or two warning while under the old system you had no warning."

2040

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

591

Delete line of \*\*\*\*'s and insert the following:

2057

"Q. When was the feasibility of hydrogen weapons established?

"A. I have no knowledge that it has been established yet.

"Q. You mean you still don't know that they will work?

"A. I do not know, no. I know about subsequent developments on certain thermonuclear devices.

"Q. Wasn't there a test of a hydrogen weapon? Haven't there been tests of hydrogen weapons?

"A. I think that is questionable, but perhaps not a good subject for discussion here.

"MR. GRAY: You mean from the point of view of security?

"THE WITNESS: That is right.

"MR. GRAY: Do you want to pursue this?

"MR. ROBB: Perhaps I might finish up other matters first."

594

Delete line of \*\*\*\*'s and insert in lieu thereof:

2069 &  
2070

"A. I do not remember the exact wording, but I know that my feeling was that the important thing was to strike immediately against their tactical airfields and the immediate military targets that could attack our field forces. This had to be done within a matter of hours after hostilities, while the long range strategic operations could at best be days, and that the immediacy of the attack was not nearly as important as in the case of the ground forces."



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

595  
9th from bottom

Delete line of \*\*\*\*'s above line 9 from bottom, and after the words have to say so. Add (the following new paragraphs):

2073

"The question is: Is there any difference in your thinking between what is described as an H bomb and what is described as thermonuclear weapons and devices?

"A. I think it is clear from the way I answered these questions that there is, but the explanation of it, I think, is classified with a very high degree of classification. It involves technical details that could only be considered of a high degree of classification.

"Q. Let me ask another question that I think will not involve or that may not involve any classified information:

"Is it fair to conclude from what you have just said that you might have held one kind of a view with respect to thermonuclear devices and thermonuclear weapons and a quite different view with respect to a hydrogen bomb?"

595  
last line

Last line, delete \*\*\*\*'s, and after the words thermonuclear weapons. Add: "This, I think is very different from a crash program on a hydrogen bomb. Such a crash program I believe would interfere seriously with other things that we needed very badly if we were to carry out the mission that was assigned to Vista. If our total effort in this field went into a crash program on hydrogen bombs, starting in 1950, I believe it would seriously interfere with things that we needed urgently.

2074

597  
9th from top

After the words which I directed. Add: "a study of overseas transport, specifically directed toward the antisubmarine problem."

2078

597  
11th from top

Line 11 from top - delete \*\*\*\*'s and after the words of that study. Add: "That was a study on air defense, although a general study of the



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

597  
14th from top

air defense, specifically for force of time  
had to think mostly about defense of continental  
North America."

After the word Laboratory. Add: "now a large  
air defense laboratory in Lincoln, Massachusetts.  
It is in Lincoln, Lexington and Bedford,  
Massachusetts."

598  
6th from top

Line 6 from top - delete \*\*\*\*'s and after the  
words controversial thing. Add: "Continental  
has been to a certain extent controversial.  
Present national policy on continental defense  
is especially gratifying to those of us who did  
work on that study because national policy has  
turned enough in the direction of making  
continental defense so that I think it is an  
important thing to get on the table."

2081

598  
23rd from top

After the words was great enough. Add: "whether  
the United States was indeed capable of making a  
defense. The question was whether we were capable  
of making a defense that was worth the effort,  
worth the making and worth the cost in dollars  
and men."

2082

598

Delete \*\*\*\*'s above line 14 and insert:

2084 &  
2085

"On the first, which was clearest in our minds,  
and which has been enough in the newspapers so that  
I can say it, we formulated the technical side of a  
warning system against aircraft that might be  
launched from Russia toward the United States. We  
formulated the technical details and laid plans for  
a warning system that would be substantially across  
the top of the world from Hawaii around through the  
north, back down across to England, and another part  
down to the Azores.

"There were many people in all branches of the military  
and civilian life who felt that this was an impractical  
thing to do, that such a warning system would be too



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

expensive, too monotonous; it would take too many people and too many dollars. It is my feeling that the major role of science in technology is to cut the dollars and men out of the military projects. We cut this by devising new methods which have indeed over the past year and a half been proven technically. We have devised new methods whereby it is economically sound and quite feasible to have such an early warning system. We formulated tentative plans for carrying the air battle out beyond the continental confines of the United States. We formulated plans to try to carry any possible air battle out away from the cities.

"Q. You mean to keep it from getting to the cities?

"A. To keep it from getting to the cities, but also to keep the battle from going over cities. Air Defense Command is in the United States. We felt that it was very important to learn how to fight an air battle out away from the country in order to pull its sting, in order to reduce it, and possibly to turn it back altogether.

"The last part of that study was devoted to possible intercontinental ballistic missiles, and on these last two things, the remote air battle and missiles, I would like to discuss these things only under military secrecy. The atomic energy secrecy I think would not be importantly involved, although to a certain extent there, too."

598  
9th from bottom

After the words emotion in it. Add: "Let me say in direct answer to your question that the national policy apropos of continental defense is quite in keeping with the recommendations that were made by that study. Before the study, they were not." 2085 & 2086

617  
12th from top

After the words I won't. Add: 2147

"The purpose of the Vista Project was to investigate methods of tactical warfare, particularly as

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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they pertained to the problem of Western Europe. We felt that one of the important ways in which our strength in Western Europe could be bolstered at that time, and in fact one of the things that could really be brought to bear on the problem of keeping to Russians out of Western Europe was the tactical employment of atomic weapons. We felt at that time that we had a sufficient stockpile of atomic weapons that utilization in this field was both possible and appropriate and that it would be a great advantage to our military strength to do this. So recommendations were made in this direction, that the tactical use of atomic weapons be developed and increased, and that a potential in this direction be built up.

"On the question of allocation of weapons to tactical use, I think that this is apt to be somewhat misleading because there existed, or was about to exist -- I am not quite sure of the time scale -- means by which the essential components of the bomb could be made available for one type or another quite readily. I don't believe that is classified."

617  
25th from top

After the words through the summer. Add: "and a group of which I was the Chairman, or at least I was responsible for the group, was formed for the employment of atomic weapons."

2148



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UNITED STATES ATOMIC ENERGY COMMISSION

PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Tuesday, April 27, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the board, at 9:30 a.m.

Personnel Security Board: Dr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb, and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

673  
21st from top

After the words atomic warfare. Add: "The  
Summer Study Group made recommendations to the  
Department of Defense in regard to strengthening  
our defenses against air attack."

2327



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UNITED STATES ATOMIC ENERGY COMMISSION

PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Wednesday, April 28, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the board, at 9:45 a.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb, and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman, and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

682 21st from top	After the words <u>smaller bombs</u> , delete ****'s and add: "I remember his saying most vigorously that they couldn't make them too big for him."	2350
683 15th from top	After the words <u>same project</u> . Add: "When asked to state how super the Super weapon was, he stated that once the principle is proven, there is no limit to its power."	2353
684	Delete line of ****'s above line 14 from bottom and insert in lieu thereof: (new paragraph)  "On technical grounds, Dr. Oppenheimer did not support the full long range detection program of the Air Force. The Air Force had been charged by the Joint Chiefs of Staff with determining the first atomic bomb which might be exploded in Russia."	2359
684 last line	Last line of page -- delete ****'s and after the word <u>projects</u> . Add: "You will note that a ship, even though it is tactically offensive, is strategically defensive, whereas the nuclear powered aircraft is a strategic offensive weapon, and it was one in which the Air Force still places great hopes."	2359 & 2360
695	Delete line of ****'s following line 3 from top and insert in lieu thereof:  "THE WITNESS: Technically, sir, I don't feel qualified to answer. But strategically it is a field of tremendous promise, because here is an airplane that can do such things as overfly Russia at local midnight at every point of surface in the land. It can fly at high altitude or low altitude at the same speeds. Things of this sort which are not possible of accomplishment with the present day airplane. These are areas of promise that make it of such importance to the Air Force."	2393



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

696  
30th from top

After the word start. Add: "For instance, one was the B-36 drone, which is not good. Others were more modern airplanes that were coming up. We even had in the kit a design on paper that was flexible enough to fit almost any weight that we might finally find we had to lift. Specifically studied were the B-47 and the B-52 and then as a very quick short range project, the B-36 as a drone."

2398

697

Immediately following line 29 from top of page delete line of \*\*\*\*'s and insert in lieu thereof:

2401

"Q. Is there any question, General that there are targets in Russia, and that there would be targets in the event of a war with Russia, upon which the thermonuclear weapon should be employed?

"A. Yes, sir.

"Q. Beg pardon?

"A. Yes, sir.

"Q. You say there is question?

"A. No, there is no question. There are targets in Russia against which this weapon should be employed."

722  
2nd from top

After the words adequate safeguard. Add: "I believe that this is today even clearer than it was at that time."

2486

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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Thursday, April 29, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the board, at 9:30 a.m.

Personnel Security Board: Dr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb, and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman, and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

734  
22nd from bottom

After the words mean a great deal. Add: "That time was of the essence in this thing. That we didn't have very much time to cope with this tremendous problem."

2517

734  
10th from bottom

After the words in this thing. Add: "even to the point of preventive war."

2518

746  
14th from bottom

After tactical warfare. Add: "with particular reference to a possible campaign in Europe."

2558

747

Delete line of \*\*\*\*'s immediately following line 36 from the top of page and insert in lieu thereof:

2561 &  
2562

"This was a statement substantially to the effect that it was recommended that the President of the United States announce that the United States would not use its strategic air force in attack on cities or industrial economy, as I recall the statement, until our cities had been attacked.

"I regarded this as a very dangerous recommendation and that if it were adopted by the United States at that time -- and my recollection is that it was proposed for immediate adoption -- that it would have deprived us of the one important military advantage that we had vis a vis the Soviet, except in the case of course in which they attacked our cities as the first act of war. In other words, from where I sat, this recommendation if adopted would have greatly restricted our freedom of action and could have been catastrophic, for instance, in the event of an attack on Europe, which was after all the Vista frame of reference."

747

Delete line of \*\*\*\*'s above line 23 from bottom and insert in lieu thereof:

2562

"The first was a recommendation that our atomic stockpile -- is somebody checking our security here?

"MR. ROLANDER: Yes.

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

"THE WITNESS: -- be divided into three parts, that is, three roughly equal parts, one of which would be allocated to the Strategic Air Force, one of which would be allocated to tactical warfare, and the third held in reserve. Who is security monitor here?

"MR. GRAY: Mr. Rolander is the security officer.

"BY MR. ROBB:

"Q. Why did that strike you so forcefully?

"A. At the time this recommendation was made, there was no allocation of the stockpile. We thus had comparative freedom of action to use the stockpile in any way that the Department of Defense and the President saw fit. Had this decision been accepted as in the case of the earlier decision, it would have reduced our freedom of action, would specifically have reduced the ability of SAC."

747  
15th from bottom

After the words this second point. Add: "namely, the suggested tripartite allocation of the stockpile." 2563

748  
17th from top

After the words Vista Project. Add: "specifically suggesting ways and means in which thermonuclear weapons could be useful in a tactical campaign." 2565

748  
18th from top

After the words specific problem. Add: "and the conclusions have not been consistent with that statement in the Vista Report." 2565

749

Delete line of \*\*\*\*'s above line 19 from bottom and insert in lieu thereof: 2570

"It was reported to me by people who were asked to join the Lincoln Summer Study that this study was to consider the relative importance of the Strategic Air Command and the Air Defense Command, make recommendations as to budget allocations."



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

753  
4th from top

After the words we only had. Add: "ten".

2581

759

Delete line of \*\*\*\*'s above line 15 from bottom and insert in lieu thereof:

2604

"Q. Now, as to the point that our atomic stockpile was divided into three roughly equal parts, was that the suggestion or was it rather that the stockpile be thought of as divided?

"A. My recollection is that it was a recommendation that the stockpile be divided into three parts, one of which was to be allocated to strategic use or to use by the Strategic Air Force -- I am not sure which of those statements it was -- and so on.

759

Delete line of \*\*\*\*'s above line 5 from bottom and insert in lieu thereof after the words use of atomic weapons.

2605

"I would add one point while we are on this subject. The reason I am so sure of this is because that was in fact our policy at that time, and the proposal that we divide the stockpile -- and the proposal that we publicly announce that we are not going to use the Strategic Air Force for one use, restricted our flexibility, and therefore was in direct contradiction to the succeeding statement in my estimation.

"Q. Did not the draft ~~make~~ the suggestion that we should have on the shelf enough weapons so that we would be able to use them, either strategically or tactically or whichever way the circumstances might justify?

"A. Yes. This suggestion, I think, was made in the Vista report. It also happened to be Defense Department policy at the time."

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Page and Line No. U.S. GPO copy; 1954	Remarks	Page No. Classified Copy
763 3rd from top	After the words <u>in studies of</u> . Add: "tactical".	2615
764 28th from bottom	After the words <u>air defense</u> . Add: "by the Charles group, the Charles project,"	2620
764 20th from bottom	After the words <u>problem of air defense</u> . Add: "in the 1950-1960 period, or some such thing."	2621
772 3rd from top	After the words <u>would be triggered</u> . Delete the (.) Add: "with the explosion of an ordinary atomic bomb."	2645
	"Q. When you used the term thermonuclear weapon in that connection, to what sort of a weapon do you refer as to its power?	
	"A. As I remember the discussion, the weapon consisted solely of a deuterium reactor. Perhaps reactor is the wrong word there. I mean a mass of deuterium in which the reaction would take place under the heat of the reaction from the atomic bomb.	
	"MR. ROLANDER: Do you have any problem on classification?	
	"THE WITNESS: I do not think so. Pardon me for suggesting but I do not think it is classified."	
772 12th from bottom	After the word <u>Yes</u> . Add: "there was what I was told by its builder was the largest liquid hydrogen plant in the world. I was not at all surprised to find it there because I remembered Dr. Oppenheimer's great interest in the super weapon and knew that in order to make such a weapon work one would need large quantities of liquid deuterium, and this was a plant designed to liquify deuterium."	2648
776 Line 1	After the words <u>tritium was</u> . Add: "the critical."	2659



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

776  
15th from bottom

After the words of free neutrons. Add: "and in order to make these radioactive agents at least a gram of free neutrons per day would be needed. The military could hardly become enthusiastic about a program that could not be initiated unless piles of this type had been built. We felt they appreciated the usefulness of this method of warfare but thought it was so far in the future as not to cause them any immediate concern."

2662

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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Friday, April 30, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the board, at 9:30 a.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb, and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman, and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

797  
11th from bottom

After the words be then oriented. Add: "I  
had no idea of the fact that this report was  
to affect immediate policy."

2723

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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Monday, May 3, 1954

The above-entitled matter came on for hearing pursuant to recess before the board, at 2:30 p.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb and C. A. Rolander, Jr., counsel for board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman, and Allen B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

850

Delete line of \*\*\*\*'s above line 22 from the bottom of the page and after the words to the consulate. Add: "But isn't it common practice for a Consulate or a Legation to have some espionage attached to them?"

2887

"P. Oh, yes. Military Attaches are really unofficially.

"O: Spies.

"P: That's their business."

860  
21st from top

After the words to the consulate. Add: "But isn't it common practice for a Consulate or a Legation to have someone attached to them?"

2919

"P: Oh, yes. Military Attaches are really unofficially."

860  
25th from top

After the words attached to the Consulate. Add: "But isn't it common practice for a Consulate or a Legation to have some espionage attached to them?"

2919

"P: Oh, yes. Military Attaches are really unofficially.

"O: Spies.

"P: That's their business."

869  
5th from top

After the words to the Consulate. Add: "But isn't it common practice for a Consulate or a Legation to have someone attached to them?"

2929-19

"P: Oh, yes. Military Attaches are really unofficially."

872

Delete line of \*\*\*\*'s at top of page, and after the words final document? Add: (new paragraph)

2999

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Page No.  
Classified  
Copy

Page and Line No.  
U.S. GPO copy; 1954

Remarks

"A. Not in that form, and the reason should be clear from the testimony we have heard. The suggestion that there might be circumstances under which war would not be initiated by the full all-out Strategic Air Command was very disturbing to people in the Air Force, and many other people as well. It was not directly relevant to the main point we wished to make in this chapter. We therefore rewrote that part of it with a much more detailed listing of target systems in the order of the probable priority of the effect of strikes at them on the outcome of the battle in Europe -- priority simply in time. I believe that the draft which I last saw -- I have had the final report -- discussed the vast industrial target system in these terms, these much more neutral terms, rather than saying there might be circumstances under which they would not be attacked at once."

892  
29th from top

After the words formal terms. Add: "He objected to the distinction between tactical and strategic targets. He said at the present time any change in the air plan would certainly be bad, and that this was not an acceptable statement of the case."

899

Delete line of \*\*\*\*'s after line 23 from top; and after the words It was indeed. Add: "I should always work Ulam's name in, but Teller should be in bigger type."

900  
5th from bottom

After the words divide it up. Add: "into three parts."

900

Delete line of \*\*\*\*'s at bottom of page and insert in lieu thereof:

"We were given an Air Force at that time quite incapable of using atomic weapons tactically."



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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Tuesday, May 4, 1954

The above entitled matter came on for hearing before the board, pursuant to recess, at 9:30 a.m.

Personnel Security Board: Dr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb, and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman, and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

923  
25th from top

After the words a growing threat. Add: "a threat growing in number of Russian weapons and in the variety of their means of delivery."

3095

924  
20th from top

After the words submarine warfare? Add:

3098

"A. The purpose of the summer study was primarily air defense and defense of the continent."

924

Delete line of \*\*\*\*'s after line 24 from top and insert in lieu thereof:

3099

"Q. Was there any consideration in the summer study of the problem of defense against missiles launched from submarines?

"A. Yes.

"Q. Would you tell us about that?

"A. Yes, there was. In discussing the various types of missiles, those launched from ground and those launched from ships and those launched from submarines, we went through a certain amount of argument to prove to ourselves that the best defense against submarine launched missiles was an attack against or defense against the submarine itself. We felt that we would not be able to set up a defense against missiles once launched from submarines. That was a more difficult problem than the counter-submarine problem. There was argument with a number of people in the Navy on this very point."

933  
3rd from top

After the words Hartwell project the. Add: "anti-submarine".

3128

935  
33rd from bottom

After the words in the summer. Add: "and sort of grew into Lincoln."

3137

936

Delete line of \*\*\*\*'s after line 15 from top and after the words Oh, yes. Add: "At one point I believe we stated the purpose was to look at air defense in the era 1954 to 1960."

3139



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Page and Line No.  
U.S. GPO copy; 1954

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Page No.  
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"Q. What did that mean?

"A. That was the general purpose. It was to try to see what technological and military actions could be taken to face the threat of 1954 to 1960. We felt that the Charles study, of which I was a member, looked more at the immediate things and at only a part of the problem in this time period."

937  
3rd from top

After the words be looked at. Add: "such as 3142  
early warning and defense against inter-  
continental ballistic missiles -- giant rockets --  
things of this sort."

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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Wednesday, May 5, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the board, at 9:30 a.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer; Lloyd K. Garrison, Samuel J. Silverman, and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.



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Page and Line No.  
U.S. GPO copy; 1954

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Page No.  
Classified  
Copy

950

Delete line of \*\*\*\*'s above line 15 from bottom  
and insert in lieu thereof the following:

3177,  
3178,  
3179, &  
3180

"Q. Dr. Alvarez mentioned the expression 'a gram  
of neutrons per day' --

"MR. ROBB: How is that?

"MR. SILVERMAN: 'A gram of neutrons per day'.  
I think you will find that in his diary.

"MR. ROBB: Do you have the transcript on that?

"MR. SILVERMAN: I have it.

"MR. ROBB: I recall the expression of a gram of  
neutrons, but the 'per day' I don't recall.

"MR. GRAY: I think it would be well to indicate  
more precisely --

"DR. EVANS: I think he said 'a gram of neutrons  
per day.'

"MR. ROBB: May be he did. I don't know. It just  
struck me. He may well have said it. I would just  
like to be able to look at it.

"MR. GRAY: Let us hold a minute.

"MR. SILVERMAN: I think I can find it, sir.

"On October 9th in the diary. I will say that  
there the expression in the diary is just 'gram  
of neutrons recommended'.

"MR. ROBB: That is right.

"MR. SILVERMAN: Let us see what the testimony is.

"MR. ROBB: It may well be, Mr. Silverman. I don't know.  
What was that date in the diary?

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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"MR. SILVERMAN: October 9. Page 2661 of the transcript. It is on page 2662 Dr. Alvarez said, 'People agree that the idea of radiological warfare was attractive in many ways, but again the country had no supply of free neutrons and in order to make these radioactive agents, at least a gram of free neutrons per day would be needed. The military could hardly become enthusiastic about a program that could not be initiated unless piles of this type could be built. We felt that they appreciated the usefulness of this method of warfare, but thought it was so far in the future as not to cause them any immediate concern.'

"MR. ROBB: Then I asked the question, 'Gram of neutrons recommended, is there any comment to make about that.'

"Go ahead. I am sorry. I just wanted to get it precisely.

"MR. SILVERMAN: I don't see that it adds any more to the gram per day.

"MR. ROBB: It is all right. It is on the record, anyway.

"MR. SILVERMAN: That refers to the entry in Dr. Alvarez's diary of October 9, 1949.

"BY MR. SILVERMAN:

"Q. Now, as I say, Dr. Alvarez in his testimony used the expression, 'a gram of free neutrons per day', and in his diary he talked something about a gram of neutrons.

"Do you know where that phrase first appeared in the official literature?

"A. I have not read all the official literature. In the summer of 1948 I was Chairman of a panel



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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
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of the Committee on Atomic Energy of the Research and Development Board, which met in Berkeley. I think the members of that Board were all military, but we consulted with civil experts. In that report, I for the first time wrote that we needed at least a gram of free neutrons a day, and the facilities for that were required for military purposes. That was the summer of 1948.

"I will not say that no one had written it before. I never saw it before, or heard it before.

"Q. I would like to ask one question off the record because I hate to dispose my ignorance. Is that a lot of neutrons?

"A. By then existing standards it seemed an awful lot of neutrons.

"MR. GRAY: I think it is useful to have it in the record if this point is meaningful.

"MR. SILVERMAN: All right."

951  
3rd from bottom

After the words such an opinion. Add: "With one possible exception, and barring tests conducted recently of which I don't know, no United States test of an atomic device has ever failed in the sense that what went on deviated markedly and negatively from theoretical prediction." 3184

952  
21st from bottom

After the words extremely depressing. Add: "10-20 per cent." 3186

952  
17th from bottom

After the words of the Charles study. Add: "I thought that over the next, say, few years, four years, our defensive capability could and would rise perhaps to the point where 30 or 40 per cent of incoming aircraft would actually be shot down. I thought as enemy capabilities developed, and above all if really long range ballistic rockets, ballistic missiles came into the picture, the picture would get bleak again, and therefore I 3187

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Page and Line No.  
U.S. GPO copy; 1954

Remarks

Page No.  
Classified  
Copy

tended to draw on the blackboard a curve which was very low at that time, which rose to a maximum of maybe five or eight years later, and which then fell down again as offensive capabilities increased.

"I had heard enthusiastic tales about early warning and about remote intercept largely from Berkner and through Rabi from Berkner. I thought the views presented were exaggeratedly optimistic with regard to remote interceptor. I had become aware of the importance for air defense, for civil defense, and for SAC for strategic air, of the best early warning we could get.

"I think today I am along with everyone else clear that the early warning problem can be solved in a satisfactory way. I am not clear that remote intercept is a sensible or possible thing."

953  
12th from top

After the words use of it. Add: "For eight or nine years the atomic bomb and the planes of the Strategic Air Command, and its base system have been the greatest single component of our military effort, and I think the only offensive component that amounts to anything." 3189

955

Delete line of \*\*\*\*'s below line 17 from top and insert in lieu of the following: 3196

"BY MR. ROBB:

"Q. Do you want to paraphrase that, Doctor?

"A. 'Without the use of fission trigger.'"

957  
33rd from top

After the words thermonuclear reactions. Add: "and I paraphrased 'without the use of a fission bomb trigger.'" 3203



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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

In the Matter of J. Robert Oppenheimer

Atomic Energy Commission  
Building T-3, Room 2022  
Washington, D.C., Thursday, May 6, 1954

The above-entitled matter came on for hearing, pursuant to recess, before the board, at 9:30 a.m.

Personnel Security Board: Mr. Gordon Gray, chairman; Dr. Ward T. Evans, member; and Mr. Thomas A. Morgan, member.

Present: Roger Robb and C. A. Rolander, Jr., counsel for the board; J. Robert Oppenheimer, Lloyd K. Garrison, Samuel J. Silverman, and Allan B. Ecker, counsel for J. Robert Oppenheimer; Herbert S. Marks, cocounsel for J. Robert Oppenheimer.

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No classified deletions were made.



